

Book review: *The New Production of Knowledge - The Dynamics of Science and Research in Contemporary Societies*, by Michael Gibbons, Camille Limoges, Helga Nowotny, Peter Scott Simon Schwartzman, Martin Trow. London, Sage Publications, 1994.

Joseph Agassi, *Philosophy of the Social Sciences*, 27, 3, 354-357, Sept. 1997

As this book displays the state of the art in a relatively new academic discipline, the sociology of science and science policy studies combined, it deserves study disappointing though it is. Though short, it is no easy read; it often uses heavy language to say the obvious, yet it is the obvious that is, unfortunately, often overlooked. The book often presents the obvious as novel, however. For example,

This description of the changing nature of innovation in the global economy has important implications for the future shape of knowledge production. Whereas value used to be added by developing technologies which would allow for economies of scale, now these economies need to be augmented or replaced by economies of scope arising from the application of skill and insight in configuring resources, particularly knowledge resources, in novel ways, and doing so not just singly, but continuously. (p. 63)

Here past economic growth is erroneously and unnecessarily explained as due to economies of scale. This is a variant of Marx's view, which implies that competition increases the concentration of capital. This sounded reasonable as long as the steam engine was the only significant source of power, not in the presence (for more than a century now) of the electric motor. The variant presented in this book is wild. Since much of it taps economics, it would have been wise to include an economist on the team of its authors (see especially p. 63). What the paragraph cited here says and elaborates on later is true: the economic advantage of industrialized countries over the rest of the world is in the skills that enable constant technological growth. My apology for this detailed discussion of one paragraph: the rest of this review will be less pedantic.

When scientific status is claimed for an idea about science, it clearly ought to be applicable to itself. This book probes research procedures that sooner or later get established; it describes unrecognized procedures as unscientific or not yet scientific (p. 2). It thus reads differently when considered already or not yet favored by the establishment. When Albert Einstein said "scientists are opportunists" ("Scientific Autobiography"), he was ignoring the majority who repose in their niches. He also bypassed the way opportunists endure. (He himself was tremendously lucky as Max Planck recognized him at once.) The growth of research to its post-World War II mammoth dimensions directed sociologists to the normal, timid (industrial) researchers. Here, ideas of Michael Polanyi and Thomas Kuhn were found useful, as they justify the timid researcher. (Kuhn justifies also the use of pressure by academic power brokers to force the rank and file to toe the line and believe the new paradigm.) The prerequisite here, however, is to boost the power brokers by identifying them with brilliant researchers and present established record keepers as

wildcat prospectors. This book cheers those who sooner or later force power brokers to reform research practices, yet it shares this identification (see p. 106). Whose side is this book on? It hedges, because of the vague status of the authors and their discipline as semi-established.

The authors' hearts are in the right place, though. The book is full of the right cliches: science is dynamic, science does not grow in the vacuum, contents and organization interact, some scientific technology is scientific knowledge, and self-criticism is laudable. Is this said in approval or in protest?

A new term is introduced: Mode 2. Mode 1 is (allegedly) traditional: Newtonian, learned, disciplined, and above all, sound (p. 169). It will not be outmoded, however, as 95% of all researchers work in recognized modes (p. 1). Who count as researchers and how is their mode recognized? Throughout, the book presents industrial research, normal science Kuhn-style, as Mode 2, yet it is Mode 1. Much of the praise lavished here on Mode 2 is explained as the flexibility of markets being higher than that of the academy. This is not much of a praise. What is needed is a discussion of the demand to increase workers' ability to participate in the process of innovation, to increase public control of industry, and to improve standards of safety and obligatory testing. The authors say their views apply also to the arts, the humanities, and the social sciences, but they also admit that this is not so (see defensive p. 96).

What, then, is research Mode 2? It is bold, reflexive (read self-critical; see, however, p. 110), transdisciplinary, and heterogeneous. After World War II, research did organize in dramatically new ways, but its novel characteristics are misdescribed well here: the explanation of the origin of Mode 2 (p. 10) makes no mention of the Manhattan project. Vannevar Bush (1946) and Alvin Weinberg (1963) are reported (p. 158) to have observed that now full control of the allocation of vast research moneys is in few hands and that this is a snag. What is to be done? No answer is given other than a praise of the market mechanism. No mention is made of the proposal to erect public bodies for the reassessment of the decisions of committees every now and then, not even for the discussion of new criteria of allocation of resources (see timid p. 161ff.). Some current criteria are external (the promotion of international cooperation is a criterion in Sweden, whose government has supported this project) and the public should check these, as well as intellectual loyalty: contra Polanyi and Kuhn, public controls should be placed against the dispositions of committees to support only established researchers and established lines of inquiry.

The discussion of quality control is brief (p. 8; see also pp. 31-4, 78-9, 100, and particularly 152, where proposals are made that sound very far-reaching but are commonplace) and contrasts peer review in Mode 1 with the marketability in Mode 2. The main factor, the rise of a new and vast science-based industry, is discussed as novel, though the trend began early in the industrial revolution. The novel matter here is not any new social accountability (dreamed up on p. 36), but expansion and its problems, including ecological ones that belong elsewhere.

Education plays a big role here, of course. The authors discuss the fact that universities have expanded and that they prepare new technological cadres. This is only partly true: it would be, had universities open admissions. Were going to a university merely a matter of the acquisition of skills, there would be no

haggling over grades and engaging lawyers, which is a practice growing in different continents with alarming speed. The authors are, as usual, too complacent.

The book includes a few examples. They are all brief and presented as cases of Mode 2. One example is the hypersonic aircraft (p. 20ff.), a case of basic research (read theoretical with an eye on the practical). Is all basic research Mode 2? If not, what is special here? No answer. Another example, architecture (p. 97ff.), is regrettable, as it confuses the benignly interdisciplinary with the uselessly eclectic and even with the undisciplined. Example 3 concerns the *Annales* (p. 106ff.), the historical journal that presents an academic school that was entrenched by one person. All of a sudden a power base appears through the cracks (p. 106), with no analysis except the statement that the person in question is a good organizer and, more importantly, a good scholar. As if there are no better scholars in France today whose organizations are less remarkable. The authors find Mode 2 traits in the tradition of the *Annales*, which is facile, seeing that this tradition is old-fashioned at heart, not to say defunct, as it follows the idea that history has a grand scheme. Its view of the grand scheme of history may be true, but the self-critical attitude which the authors so warmly recommend requires some rational debate on the matter, some response to critics. The authors admit that the situation is inconclusive, especially regarding Mode 2: everyone is welcome to it. The case of the failure of the Brazilian authorities to modernize is another example (p. 134ff.) briefly and most inadequately analyzed. Finally, some National Science Foundation self-advertisement (p. 142) swallowed hook, line, and sinker.

No doubt, this book is a failure, and the failure is ours - the whole intellectual venture that now encompasses vast industries which are penetrating the academy despite resistance. The resistance is silly, both because it is hopeless and because the breaking down of the walls of the academy is all to the good. But the change invites planning and planning requires much more research than what is going on.

The most amazing aspect of the book's failure is its acceptance of the received adage that the social sciences cannot compete with the natural sciences in the significance of their practical contributions. When the survival of humanity depends on wise policies that have not yet begun to be drafted, this is strange; for example, there is hardly any topic more transdisciplinary than drug abuse. Back to the drawing board and with more Mode 2: more daring, imagination, and opportunism. Let us have more Mode 2 research.

Finally, the index. It is a disgrace.

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